Amore

AF/ 3641

Docket No.: GR 98 P 3112

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date indicated below.

**MAIL STOP: APPEAL BRIEF-PATENTS**

By: ______________________ Date: March 23, 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

| | | |
|---|---|---|
| Applic. No. | : | 09/655,091 Confirmation No.:8366 |
| Inventor | : | Johann Meseth |
| Filed | : | September 5, 2000 |
| Title | : | Containment Vessel and Method of Operating a Condenser in a Nuclear Power Plant |
| TC/A.U. | : | 3641 |
| Examiner | : | Jack Keith |
| **Customer No.** | **:** | **24131** |

Hon. Commissioner for Patents
Alexandria, VA 22313-1450

# BRIEF ON APPEAL

S i r :

This is an appeal from the final rejection in the Office action dated September 18, 2003, finally rejecting claims 1-8.

Appellants submit this *Brief on Appeal* in triplicate, including payment in the amount of \$330.00 to cover the fee for filing the *Brief on Appeal*.

03/31/2004 RMEBRAHT 00000059 09655091
01 FC:1402 330.00 OP

Real Party in Interest:

This application is assigned to Framatome ANP GmbH of Erlangen, Germany. The assignment will be submitted for recordation upon the termination of this appeal.

Related Appeals and Interferences:

No related appeals or interference proceedings are currently pending which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Status of Claims:

Claims 1-8 are rejected and are under appeal. Claims 9-14 have been withdrawn from further consideration.

Status of Amendments:

No claims were amended after the final Office action. *A Response under 37 CFR § 1.116* was filed on December 22, 2003. A *Notice of Appeal* was filed on January 23, 2004.

Summary of the Invention:

As stated in the first paragraph on page 1 of the specification of the instant application, the invention relates to a containment vessel of a nuclear power plant, having a condensing chamber, a pressure chamber and a condenser disposed in a top region of the pressure chamber.

The invention also relates to a method of operating a condenser in a nuclear power plant.

As stated in the first paragraph on page 1 of the specification of the instant application, the invention relates to a containment vessel of a nuclear power plant, having a condensing chamber, a pressure chamber and a condenser disposed in a top region of the pressure chamber. The invention also relates to a method of operating a condenser in a nuclear power plant.

Appellant explained on page 12 of the specification, line 17, that, referring now in detail to the single figure of the drawing, there is seen a reactor pressure vessel 2 which is disposed centrally in a closed containment vessel 1, that is also merely referred to as a containment. A condensing chamber 4 and a flood basin 8 disposed above it are provided laterally next to the reactor pressure vessel 2, as further built-in components in the containment vessel 1. The flood basin 8 is open at the top toward an interior space of the containment vessel 1. The interior space is also designated as a pressure chamber 6. The latter forms a common pressure space with the flood basin 8.

Appellant outlined on page 13 of the specification, line 4, that the condensing chamber 4 and the flood basin 8 are each partly filled with a cooling liquid f, in particular water, up to a filling level n. The maximum filling level n in the flood basin 8 is determined by a top end of an overflow pipe 10. The overflow pipe 10 connects the flood basin 8 to the condensing chamber 4 and discharges into the cooling liquid f of the condensing chamber 4. If the maximum filling level n is exceeded, the cooling liquid f flows off from the flood basin 8 into the condensing chamber 4. Furthermore, the flood basin 8 is connected through a flood line 12 to the reactor pressure vessel 2 and can supply the latter with sufficient cooling liquid f in an emergency.

It is stated in the last paragraph on page 13 of the specification, line 17, that the condensing chamber 4 is largely closed off from the pressure chamber 6. It is merely connected to the pressure chamber 6 through a condensing pipe 14. The condensing pipe 14 is immersed in the cooling liquid f of the condensing chamber 4, so that no gas exchange takes place between the condensing chamber 4 and the pressure chamber 6. The condensing pipe 14 is closed by a water plug 15, which is formed by a water column in the condensing pipe 14. Steam only flows into the condensing chamber 4 through

the condensing pipe 14 for condensing in the event of an accident, if the pressure in the pressure chamber 6 increases.

Appellant described on page 14 of the specification, line 4, that a condenser 16, which is designated as a building condenser, is disposed in a top region of the containment vessel 1 and thus in a top region of the pressure chamber 6, in the left-hand half of the figure. The condenser 16 is constructed as a heat exchanger with heat-exchanger tubes and is fluidically connected to a cooling basin 18. In principle, the condenser 16 may also be disposed outside the containment vessel 1 in this cooling basin 18 and may be connected through pipelines to the interior space of the containment vessel, in particular to the pressure chamber 6. The cooling basin 18 is disposed outside the containment vessel 1 on a cover 20 thereof. The condenser 16 absorbs heat from its surroundings inside the containment vessel 1 and transfers it to the cooling basin 18. As a result, heat can be dissipated from the containment vessel 1 to the external surroundings.

It is further outlined on page 14 of the specification, line 20, that a drain pipe 22 is preferably disposed in the region of the condenser 16. It is important that its top end 24 is disposed in the top region of the pressure chamber 6 and in particular at a level above the condenser 16. Its bottom end

26 discharges into the cooling liquid f of the condensing chamber 4. The drain pipe 22 is constructed as a simple pipe which is free of built-in components and forms an open flow path from the pressure chamber 6 into the cooling liquid f of the condensing chamber 4. In this case, "free of built-in components" means that no valves or other fittings or components are connected in the flow path.

Appellant stated in the second paragraph on page 15 of the specification, starting at line 6, that, in this case, the immersion depth of the drain pipe 22 in the cooling liquid f is smaller than that of the overflow pipe 10 and that of the condensing pipe 14, which has a substantially larger cross-sectional area than the drain pipe 22. The bottom end 26 of the drain pipe 22 is therefore disposed above respective outlet orifices 28 of the condensing pipe 14 and the overflow pipe 10.

It is further stated on page 15 of the specification, starting at line 14, that, in the event of an accident, for example in the event of a fracture in a steam line in the containment vessel 1 and an escape of steam associated therewith, the temperature and the pressure in the containment vessel 1 increase. Various emergency cooling devices, of which only the condenser 16 and the flood basin 8 with the associated

flood line 12 are shown in the figure, ensure that the final pressure in the event of an accident in the containment vessel 1 does not exceed an admissible limit value. This is primarily achieved by cooling and condensing of the steam. An important factor in this case is the condenser 16, with which heat can be dissipated to the outside from the containment vessel 1.

Appellant explained on page 16 of the specification, line 1, that, in the course of an accident, noncondensible gases, in particular hydrogen, will possibly be released, and these noncondensible gases accumulate in the top region of the containment vessel 1, i.e. in the top region of the pressure chamber 6. The noncondensible gases which collect in the top region of the pressure chamber 6 lead to an increase in the pressure in the containment vessel 1. Due to the configuration of the drain pipe 22 and the increased pressure in the region of the top end 24, the mixture of steam and noncondensible gases there flows off through the drain pipe 22 from the top region of the pressure chamber 6 into the condensing chamber 4. The entrained steam is condensed in the condensing chamber 4. Therefore, by virtue of the drain pipe 22, an accumulation of noncondensible gases, for which the entire gas space in the condensing chamber 4 is available, is avoided in the region around the condenser 16.

It is explained in the last paragraph on page 16 of the specification, line 18, that, in principle, the noncondensible gases impair the efficiency of the condenser 16 by virtue of the fact that they substantially reduce the heat exchange capacity of the condenser 16. When noncondensible gases are present, substantially less heat per unit of time and per unit of area can be dissipated from the steam to the cooling basin 18 by the heat exchanger 16 than when noncondensible gases are absent. Since the latter are drawn off from the surroundings of the condenser 16, the condenser 16 can be constructed for saturated steam. The condenser 16 therefore does not need to have any large and specially constructed heat-exchange areas, which would be absolutely necessary if noncondensible gases were present in order to be able to dissipate sufficient heat. The condenser 16 may therefore have a simple, compact and thus cost-effective construction.

Appellant described on page 17 of the specification, line 8, that, due to the smaller immersion depth of the drain pipe 22 as compared with that of the condensing pipe 14, steam will flow out of the pressure chamber 6 into the condensing chamber 4 solely through the drain pipe 22 as long as there is only a low positive pressure in the pressure chamber 6 relative to the pressure in the condensing chamber 4. Steam can only flow

through the condensing pipe 14 into the condensing chamber 4 at greater pressure differences between the pressure chamber 6 and the condensing chamber 4, which only occur briefly in exceptional cases. The condensing pipe 14 has a large cross section of flow and therefore enables very large steam quantities to be directed for condensing into the condensing chamber 4 in the shortest possible time.

It is outlined in the last paragraph of the specification, beginning at line 22 on page 17, that, according to the present novel concept, in a containment vessel 1 with a condenser 16, noncondensible gases are automatically drawn off from the active region of the condenser 16 into the condensing chamber 4 through a flow path. In this case, the flow path is formed by a simple drain pipe 22. The mode of operation of the drain pipe 22 is purely passive, thus no external control actions are necessary. The drain pipe 22 also requires no movable components and is therefore maintenance-free. The reliability of performance of the condenser 16 is ensured by the configuration of the drain pipe 22, so that the condenser 16 may have a simple structure.

References Cited:

U.S. Patent No. 4,022,655 (Gaouditz et al.), dated May 10, 1977.

Issues

Whether or not claims 1-8 are anticipated by Gaouditz et al. under 35 U.S.C. §102(b).

Grouping of Claims:

Claims 1-2 are independent. Claims 3, 5, and 7 depend on claim 1. Claims 4, 6, and 8 depend on claim 2. The patentability of claims 3-8 is not separately argued. Therefore, claims 3, 5, and 7 stand or fall with claim 1 and claims 4, 6, and 8 stand or fall with claim 2.

Arguments:

In item 1 on pages 2-5 of the final Office action, claims 1-8 have been rejected as being anticipated by Gaouditz et al. under 35 U.S.C. § 102(b).

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia:

> a condensing pipe leading into said condensing chamber; and
>
> a drain pipe for noncondensible gases, said drain pipe disposed in said interior space and fluidically connecting said top region of said pressure chamber to

> said condensing chamber, said drain pipe defining a direct connection to said condensing chamber, and said drain pipe not connected to said condenser.

Claim 2 calls for, inter alia:

> a condensing pipe leading into said condensing chamber; and
>
> a drain pipe for noncondensible gases, said drain pipe fluidically connecting said region around said condenser to said condensing chamber, and said drain pipe having a top end disposed above said condenser, and said drain pipe defining a direct connection to said condensing chamber, and said drain pipe not connected to said condenser.

The object of the invention of the instant application is to remove the gases which may possibly arise within the containment in case of an accident and which are not condensable. The gases are removed from the inside of the containment, independently of the steam and thus via an independent branch line. According to the invention of the instant application, a drain pipe (22) is provided for this purpose. The drain pipe (22) is dimensioned and positioned, in case of a design basis accident, to lead the non-condensable gases from the top region of the pressure chamber or the surrounding region of the condenser (16) into the condensing chamber (4). The underlying consideration is that in order for the condenser to also reliably function over a long time in an abnormal occurrence, the collection or

accumulation of non-condensable gases in the effective area of the condenser should be avoided.

The Examiner has compared the drain pipe (22) of the invention of the instant application with the bubbling duct 14 of Gaouditz et al. This interpretation is simply factually unfounded.

As shown in Fig. 1 of Gaouditz et al., the bubbling ducts 13, 14 and 15 clearly relate to ducts which should enable an overflow of the steam in the condensation chamber in as far-reaching and uncomplicated a manner as possible in the abnormal occurrence, namely an unexpected steam accumulation in the pressure chamber with accompanying pressure enhancement. It is therefore clear and unmistakable that the bubbling ducts 13, 14, 15 of Gaouditz et al. should be compared with the condensing pipe (14) of the invention of the instant application. The condensing pipe (14) according to the invention of the instant application also has the task to ensure, whenever required, a far-reaching and uncomplicated steam overflow from the pressure chamber in the condensing chamber. In addition, the condensing pile (14) according to the invention of the instant application also corresponds to the dimensions and locations of the bubbling ducts 13, 14, 15 in Gaouditz et al.

The Examiner has identified the bubbling ducts 13, 14, 15 disclosed in Gaouditz et al. as different kinds of components of the invention of the instant application. This kind of interpretation is believed to be materially incorrect.

As clearly recited in the claims of the instant application, according to the concept of the invention of the instant application, there is, on the one hand, a so-called condensing pipe (14) and, on the other hand, an additional drain pipe (22) for the noncondensible gases, which has a substantially different purpose and different dimensions and position than the condensing pipe (14). In other words, due to the substantially different functions of the two components, the condensing pipe (14) and the drain pipe (22) according to the invention of the instant application have completely different structures.

In contrast, the components 13, 14, and 15 according to Gaouditz et al. are clearly the same kind of components, which, on the one hand, are arranged in a redundant manner by providing several components of the same kind and with the same function and, on the other hand, are also constructed as the same kind with regard to their relative configuration and dimensions. It is, therefore, believed to be inappropriate

for the Examiner to differentiate between the components 13,15 and 14 of Gaouditz et al. and interpret, on the one hand, the bubbling ducts 13, 15 as a condensing pipe and, on the other hand, the bubbling duct 14 as a drain pipe in the sense of the invention of the instant application.

In summary, the bubbling ducts 13, 14, 15 of Gaouditz et al. are the same kind of components with the same function and cannot be interpreted as a condensing pipe and a drain pipe respectively, which have completely different functions.

Further, it is in no way evident from Gaouditz et al. why a person skilled in the art could or should come up with a measure for a targeted draining off of non-condensable gases in addition to the so-called overflow pipes. It is especially noted that the problem which is possibly caused by the non-condensable gases is not mentioned anywhere in Gaouditz et al. In addition, the overflow ducts 13, 14, 15 in Gaouditz et al. are also not at all suitable for a planned draining off of non-condensable gases, especially because the inlets of those overflow pipes are not at all disposed at a location where the non-condensable gases can accumulate.

In addition, Appellant disagrees with the Examiner's comments with regard to the claim language "for non-condensible gases."

It is noted that there is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971). A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. See MPEP 2173.05(g).

Clearly, Gaouditz et al. do not show "a condensing pipe leading into said condensing chamber; and a drain pipe for noncondensible gases, said drain pipe disposed in said interior space and fluidically connecting said top region of said pressure chamber to said condensing chamber, said drain pipe defining a direct connection to said condensing chamber, and said drain pipe not connected to said condenser," as recited in claim 1, and "a condensing pipe leading into said condensing chamber; and a drain pipe for noncondensible gases, said drain pipe fluidically connecting said region around said condenser to said condensing chamber, and said drain pipe having a top end disposed above said condenser, and said drain pipe defining a direct connection to said condensing chamber, and said drain pipe not connected to said condenser," as recited in claim 2 of the instant application.

Claims 1-2 are, therefore, believed to be patentable over the art and since claims 2-8 are ultimately dependent on claims 1 or 2, they are believed to be patentable as well.

In view of the forgoing, the honorable Board is therefore respectfully urged to reverse the final rejection of the Primary Examiner.

Respectfully submitted,

LAURENCE A. GREENBERG
REG. NO. 29,308

For Appellants

YC/bb

Date: March 23, 2004
Lerner and Greenberg, P.A.
Post Office Box 2480
Hollywood, Florida 33022-2480
Tel: (954) 925-1100
Fax: (954) 925-1101

Appendix - Appealed Claims:

1. A containment vessel of a nuclear power plant, comprising:

an interior space;

a condensing chamber disposed in said interior space;

a pressure chamber disposed in said interior space, said pressure chamber having a top region;

a condenser communicating with said pressure chamber through a flow path;

a condensing pipe leading into said condensing chamber; and

a drain pipe for noncondensible gases, said drain pipe disposed in said interior space and fluidically connecting said top region of said pressure chamber to said condensing chamber, said drain pipe defining a direct connection to said condensing chamber, and said drain pipe not connected to said condenser.

2. A containment vessel of a nuclear power plant, comprising:

an interior space;

a condensing chamber disposed in said interior space;

a pressure chamber disposed in said interior space;

a condenser disposed in said pressure chamber and defining a region around said condenser;

a condensing pipe leading into said condensing chamber; and

a drain pipe for noncondensible gases, said drain pipe fluidically connecting said region around said condenser to said condensing chamber, and said drain pipe having a top end disposed above said condenser, and said drain pipe defining a direct connection to said condensing chamber, and said drain pipe not connected to said condenser.

3. The containment vessel according to claim 1, wherein said drain pipe forms a permanently open flow path.

4. The containment vessel according to claim 2, wherein said drain pipe forms a permanently open flow path.

5. The containment vessel according to claim 1, wherein said drain pipe has a bottom end, and said condensing chamber contains a cooling liquid in which said bottom end of said drain pipe is immersed.

6. The containment vessel according to claim 2, wherein said drain pipe has a bottom end, and said condensing chamber contains a cooling liquid in which said bottom end of said drain pipe is immersed.

7. The containment vessel according to claim 5, including a condensing pipe leading into said condensing chamber and ending below said bottom end of said drain pipe.

8. The containment vessel according to claim 6, wherein said condensing pipe ends below said bottom end of said drain pipe.